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2 $\frac{1}{2}$ -INCH UNLINED LINEN FIRE HOSE

Specification

Compiled and Promulgated by the
**AMERICAN MARINE STANDARDS
COMMITTEE**

Approved April 18, 1930
as AMERICAN MARINE STANDARD O No. 4-1930
(Superseding Standard O No. 4-1926) ✓



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FOREWORD

On January 25, 1926, the American Marine Standards Committee promulgated standard O No. 4-1926, specification for 2½-inch unlined linen fire hose. The prime object was to standardize marine requirements for that type of hose in accord with those of the Underwriters' Laboratories. Subsequently, the Underwriters' Laboratories altered its requirements. In line with the policy of the American Marine Standards Committee to keep its standards abreast of developments in products and practice, its executive board at a meeting held November 16, 1929, authorized the revision of the specification for unlined linen fire hose in order to harmonize with the new requirements of the Underwriters' Laboratories.

The revised standard herein issued supersedes that promulgated in 1926, published in AMSC 10. It defines two grades of hose deemed suitable for reliable and economical service according to present manufacturing practice. The AMSC intends to continue its function to review this standard from time to time to determine whether or not it meets the conditions then prevailing. Users are invited to cooperate by reporting any difficulty encountered in its use, or any change in practice, with suggestions for improvement.

Marine standard specifications have also been promulgated for other types of fire hose, as follows:

2½-inch double-jacketed cotton rubber-lined fire hose, standard O No. 3-1926, published in AMSC 9.
2½-inch single-jacketed cotton rubber-lined fire hose, standard O No. 11-1926, published in AMSC 17.

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SPECIFICATION FOR 2½-INCH UNLINED LINEN FIRE HOSE

1. Purpose and Use of Unlined Fire Hose.

Unlined hose, as distinguished from rubber-lined hose, contains no rubber. It is a fabric tube woven of yarn of such character that the threads swell shortly after being wet and thus close the minute spaces between the threads and make the tube water-tight.

This type of hose is intended exclusively for fire-protection purposes and for installation only at inside fire plugs or places where it can be kept dry. It is not suitable for frequent service or for use where the fabric will be subjected in service to chafing on rough or sharp surfaces, and it should be handled with care. It must not be placed where it would be exposed to wetting or dampness. If installed in spaces other than heated compartments or well-sheltered locations, it should be inclosed in tight lockers. It should be put into service without subjecting it to any wetting, as no one could guarantee the performance of hose of this type which has been in contact with water. When it has been wetted, either in service or accidentally, or allowed to become damp, it should be thoroughly dried immediately, as otherwise it will deteriorate rapidly.

2. Grades.

(a) There shall be two optional grades, viz, grade A, flax-line hose, and grade B, flax-tow hose. Hose made from flax line (grade A) shall be regarded as of first quality.

(b) *Labeled hose.*—Either of the grades specified may be purchased as labeled hose, which shall bear the official labels of the Underwriters' Laboratories. The following data relative to these official labels is given for information of users of this specification:

(1) *Source.*—The labels are obtainable only by purchase from the Underwriters' Laboratories and are issued to hose manufacturers in packages of 100, serially numbered.

(2) *Designs.*—For the types of hose covered by this specification, the labels are of cloth, 1¼ inches wide by 3⅝ inches long. Their characteristics are as follows for the respective grades of hose:

Label (A), to be used only on flax-line hose (grade A). Yellow background with red letters.	}-----{	UNDERWRITERS' LABORATORIES (INC.) INSPECTED UNLINED LINEN FIRE HOSE No. _____
Label (B), to be used only on flax-tow hose (grade B). Green background with white letters.		UNDERWRITERS' LABORATORIES (INC.) INSPECTED UNLINED FLAX TOW FIRE HOSE No. _____

(3) *Application of labels.*—The labels are to be secured to the hose by suitable adhesive or glue. They are to be located near the couplings or at intervals in numbers as follows:

At least one label to each 50-foot length.

At least two labels to each 75-foot length.

At least two labels to each 100-foot length.

At least one label to each 50 feet on rolls of 150 feet or more.

The labels are applied by the manufacturer to such of his product as is judged to conform to the specifications, under supervision of the Underwriters' Laboratories (Inc.).

(c) In requests for quotations and in purchasing, the grade desired and whether or not the hose is to be labeled, must be clearly stated.

3. Materials.

(a) *Yarn.*—The thread shall be spun from first-quality flax line for grade A, and from first quality flax tow for grade B. Flax-line yarn is composed of selected fibers which are practically free from lumps, knots, and shives; that is, pieces of the woody part of the plant. Flax-tow yarn is composed of fibers which remain after those for the flax line (grade A) have been selected. These fibers are not entirely free, but must be as free as practicable, from lumps, knots, and shives.

(b) *Chemical test of yarn.*—The yarn shall be carefully freed of vegetable gums by boiling in an alkaline solution until the soluble residue recovery by reboiling for four hours at atmospheric pressure in a 1° Twaddle solution does not exceed 8 per cent by weight of the original (bone dry) weight of the specimen of yarn tested. The 1° Twaddle solution shall be made up of one-fourth caustic soda and three-fourths soda ash, the combined weight of the caustic and ash being one-tenth of the weight of the specimen of yarn. Yarn taken from hose that has never been used should preferably show neutral reaction upon being subjected to chemical test. It must not show an acid reaction.

4. Construction.

(a) *Size.*—The trade size, or nominal internal diameter of the hose, shall be not less than 2½ inches and not more than 2¾ inches.

(b) *Fabric.*—The fabric shall be seamless, and have the fillers woven around the hose throughout its length and the warps interwoven with and covering the fillers. The interior of the hose must be as smooth as is possible with good practical manufacturing. The fabric must be even and firm in texture throughout and free from all defects, other than trifling ones, incident to good practical manufacturing.

(c) *Length of coupled hose.*—Unless otherwise ordered, the hose shall be furnished in 50-foot lengths.

5. Markings.

(a) Each length of hose must be indelibly marked with the maker's name, or his trade-mark, or other identification, and with the year of manufacture, by letters and figures at least three-fourths inch in height. These marks must be in two places on each 50-foot or shorter length of hose and must begin approximately 4 feet from the couplings.

(b) In addition to the preceding, labeled hose shall have the Underwriters' Laboratories' labels as specified in section 2, Grades.

(c) The hose of each grade shall have a distinctive and conspicuous identifier in its weave, consisting of a colored warp thread or threads made from yarn dyed in fast colors; that is, colors that will neither wash nor fade to an extent making it difficult to distinguish them, provided the hose is given reasonable care.

6. Inspection and tests—Conditions of purchase.

(a) *General.*—The physical tests hereinafter set forth are in accordance with the specifications of the Underwriters' Laboratories. They are specified in order to further define the character of the hose, but they are not actually to be made unless specifically required in asking for quotations and in purchasing. When any of the tests are to be made, the manufacturer shall furnish a certified report of the results thereof to the purchaser. Waiver of test requirements in connection with any purchase shall not be construed to deprive the purchaser of the right to make any of the tests at his own expense after delivery of the hose in order to verify its grade and quality, or of the right to require replacement of any inferior hose supplied, provided that the claim for replacement shall be presented within 30 days following delivery of the hose. Provided, however, that hose labeled by authority of the Underwriters' Laboratories with their official labels, and in accordance with their instructions, shall be accepted as complying with the requirements of this specification.

(b) *Guaranty in lieu of tests.*—When hose purchased on the basis of this specification is to be delivered without the label of the Underwriters' Laboratories, or without tests, the manufacturer or dealer shall, upon request, furnish to the purchaser a written guaranty that the hose delivered meets the requirements of this specification, and would satisfactorily pass the prescribed tests.

(c) *Bursting strength test.*—When lying straight or curved to a radius of 27 inches, the fabric must be capable of withstanding, without rupture, a hydrostatic pressure of 500 pounds per square inch, held for five seconds. A 3-foot specimen (measured between couplings) shall be cut from a full length in every 6,000 feet or less of each grade of hose and so tested.

(d) *Kink test.*—When kinked, the hose must be capable of withstanding a hydrostatic pressure of 300 pounds per square inch for five seconds without bursting. A 3-foot specimen (measured between couplings) shall be cut from one full length in every lot of 6,000 feet or less of each grade of hose and so tested.

(e) *Leakage test.*—(1) After having been subjected for 10 minutes to a hydrostatic pressure of 75 pounds per square inch and thoroughly dried, the hose must not, upon being subjected a second time to a 10-minute application of a hydrostatic pressure of 75 pounds per square inch, show a total leakage per lineal foot of hose during the first minute in excess

of 5.3 fluid ounces for flax-line hose (grade A), or in excess of 21.3 fluid ounces for flax-tow hose (grade B), or in excess of 1.2 fluid ounces during the second five minutes for either of the grades. A 3-foot sample (measured between couplings) shall be cut from one full length in every lot of 3,000 feet or less of each grade of hose and so tested.

(2) The permissible leakage values in fluid ounces (U. S. and British standards) and in cubic centimeters per 3 feet of fabric are as follows:

FLAX-LINE HOSE, GRADE A


	First minute	Second five minutes
Fluid ounces, U. S. Standard.....	15.9	3.6
Fluid ounces, British Standard.....	16.55	3.75
Cubic centimeters.....	470.00	107.00
FLAX-TOW HOSE, GRADE B		
Fluid ounces, U. S. Standard.....	63.9	3.6
Fluid ounces, British Standard.....	66.58	3.75
Cubic centimeters.....	1,890.00	107.00

CAUTION WITH RESPECT TO SAFETY IN MAKING HYDROSTATIC TESTS.—In making this test, removal of air from the specimen is important for the sake of safety. Water does not compress when under pressure. Air does. The expansion of air, if suddenly released by the bursting of the hose or by the blowing off of a coupling, might result in a serious or fatal accident.

7. Hose Couplings.

(a) The American Marine Standards Committee has indorsed for fire-hose equipment on new ships the national (American) standard fire-hose-coupling screw thread, approved by the American Standards Association in May, 1925, as Standard B26-1925. It is contemplated by the AMSC to promulgate a marine standard for construction of hose couplings which will include the national coupling screw thread. Until such standard is produced, any commercial type of coupling which has the standard thread, and is otherwise satisfactory, shall be acceptable.

(b) For hose equipments on ships in service which do not have standard thread hose connections, it is recommended, in the interest of ultimate unification of hose threads, that replacements be ordered with the standard thread and that either the ship hose connections affected be converted to the standard thread, or that suitable dual thread adapters be installed. In ordering hose for replacements, it is important that the purchaser ascertain whether or not the hose threads on the ship are standard. If they are not, and for any reason the hose to be purchased is not desired to have standard threads, full particulars of the thread required, in form of a sample coupling or gauges if possible, should be given with the purchase order.



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